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GOARN
Global Outbreak Alert and Response Network

EXECUTIVE SUMMARY

INDEPENDENT EVALUATION OF THE GLOBAL OUTBREAK ALERT AND RESPONSE NETWORK

Egbert Sondorp, Christopher Ansell,
Robert Hartley Stevens and Emma Denton

April 2011

World Health Organization

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CONTENT

LIST OF ABBREVIATIONS

GOARN	Global Outbreak Alert and Response Network
HLSP	Health and Life Science Partnership Institute, London, UK
HQ	Headquarters (WHO)
IHR (2005)	International Health Regulations (2005)
NGO	Non Governmental Organization
OST	Operational Support Team (Secretariat to GOARN, based in WHO Geneva)
RSS	Really Simple Syndication
SARS	Severe Acute Respiratory Syndrome
SCOM	GOARN Steering Committee
ToR	Terms of Reference
VHF	Viral Haemorrhagic Fever
WHO	World Health Organization

PREFACE

This extended executive summary is derived from the full report on the 'Independent Evaluation of the Global Outbreak Alert and Response Network (GOARN)', which was conducted during the year 2009 and finalized in 2011.

The evaluation was conducted by HLSP Institute, London, a UK based professional services company specializing in the health sector.

This evaluation was commissioned by the GOARN Steering Committee.

This summary presents the key findings of the first formal performance evaluation of the Network. The evaluation consisted of a document and database review, key informants interviews with Network members, Steering Committee (SCOM) and WHO staff, a questionnaire survey among members, and participation in the April 2009 partners meeting in Geneva. All detailed findings from the various documents, the interviews and the questionnaire can be found in the full report. The evaluation looked both at past achievements as well as the strategic choices that GOARN and its Steering Committee (SCOM) will face. This report aims to provide the reader with a quick overview of the main conclusions and recommendations to facilitate forthcoming discussion on the future direction of GOARN.

After a brief summary of GOARN's achievements over the past decade and some other key data, the Executive Summary consists of nine concise chapters each covering a key conclusion or recommendation.

ACKNOWLEDGEMENTS

This is the summary report of the Independent evaluation of the Global Outbreak Alert and Response Network (GOARN) initiated by the Network Steering Committee (SCOM). The primary purpose of this report is to capture major strategic issues identified during the evaluation processes so they can be highlighted to major stakeholders and interested parties.

The evaluation was guided by Terms of Reference (ToR) formulated by the GOARN Steering Committee, in collaboration with the GOARN Operational Support Team (OST) based at the World Health Organization (WHO), Headquarters, Geneva, Switzerland. The evaluation was conducted by a team of four external evaluators. The team comprised Dr. Chris Ansell (University of California), Ms. Emma Denton, Dr. Egbert Sondorp (Team Leader, London School of Health and Tropical Medicine), and Dr Robert Stevens, under contract with HLSP Institute, London. Dr Chris Ansell, of the University of California worked pro-bono on the evaluation team. Any comments or query may be sent to the authors via the GOARN secretariat (goarn@who.int).

The evaluation team wishes to express their sincere thanks to all those who contributed to the evaluation, in particular, those who contributed their time to be interviewed – including especially the SCOM members, partner institutions, and staff at WHO Regional offices, and Headquarters (HQ). The evaluation team is equally grateful to those GOARN members who contributed to the online questionnaire.

A final word of thanks to the Operational Support Team (OST) staff at WHO/HQ, who despite their busy daily schedule managed to provide the evaluation team with insights into the depth and breadth of GOARN and supply the team with the data that could be traced back covering 9 years of operations.

The full report of the evaluation containing all the detailed findings, including those from the applied questionnaire to GOARN members is available separately and on request.

BACKGROUND

The Global Outbreak Alert and Response Network (GOARN) was established in April 2000 as a global network of technical institutions and networks that have the capacity to contribute resources to international disease outbreak response. The Network has developed to include over 300 partner institutions include government agencies, universities, laboratories, non-governmental organizations (NGOs), international organizations and a range of related networks in specialist areas and diseases.

GOARN is guided by a Steering Committee (SCOM) that consists of up to 20 representatives from institutions and networks that participate in GOARN. An Operational Support Team (OST) is based at WHO Headquarters (HQ) and coordinates and conducts the day-to-day operations and activities of the Network.

Prior to 2009, the SCOM requested an independent review of the performance of GOARN. The evaluation was guided by a Terms of Reference formulated by the SCOM, in collaboration with the OST.

The evaluation was asked to focus on:

- Effectiveness - primarily of the deployment and response capacity and operations.
- Efficiency - with specific reference to the GOARN Guiding Principles.
- Leadership - specifically the role of the SCOM, and of WHO.
- Future challenges of the partnership contributing to international health security.

OPERATIONAL ASPECTS

For the purposes of the evaluation, the team examined a total of 1023 GOARN staff deployments between June 2000 and March 2009 (*See Annex 1*). Overall, 75 field missions are documented, ranging in size from 2 to 114 deployments each. The duration of field missions varies considerably. Some missions involved the one-off deployment of a team of experts, with no further rotations of staff. Other missions involved maintaining larger field teams - over extended periods - such as the response to the Marburg haemorrhagic fever outbreak in Angola (Uige), in 2005.

INTERNATIONAL OUTBREAK MISSIONS AND FIELD DEPLOYMENTS

Deployments of experts by partner institutions are shown in the following table**:

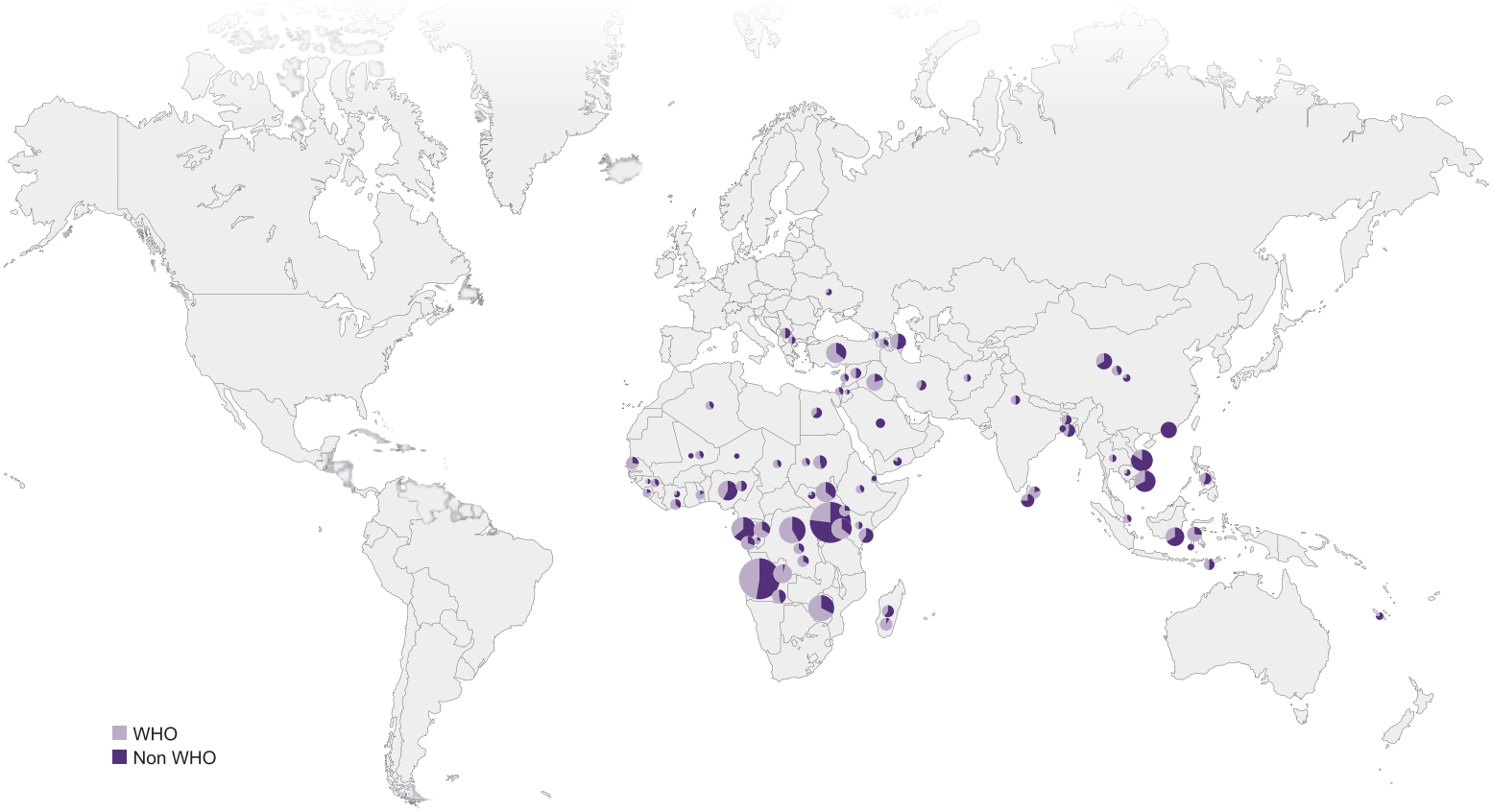
Institution name	Deployments	%
WHO Headquarters	242	24.5%
US Centers of Disease Control and Prevention	143	14.5%
WHO Country Offices*	141	14.3%
WHO Regional Office for Africa	54	5.5%
Medecin Sans Frontieres	50	5.1%
Public Health Agency of Canada	48	3.4%
Health Protection Agency, UK	18	1.8%
National Institute of Infectious Diseases, Japan	18	1.8%
Institut de Veille Sanitaire , France	16	1.6%
International Centre for Diarrhoeal Disease Research, Bangladesh	15	1.5%
US Naval Medical Research Unit	15	1.5%
European Programme for Epidemiology Intervention Training	13	1.3%
Food and Agricultural Organization	9	0.9%
Institute Pasteur, France	9	0.9%
WHO Regional Office for Europe	9	0.9%
WHO Regional Office for the Western Pacific	9	0.9%
Epicentre	8	0.8%
National Institute for Communicable Diseases, South Africa	8	0.8%
Robert Koch Institut, Germany	7	0.7%
Universiti Malaysia Sarawak	6	0.6%
Ministry of Health, France	6	0.6%
WHO Regional Office for the Eastern Mediterranean	6	0.6%
WHO Regional Office for South East Asia	6	0.6%
79 Institutions, each with < 5 staff deployed in the field	139	14.1%
Total	987	100.0%

*WHO Country offices including Angola, Armenia, Azerbaijan, Bangladesh, Botswana, Bulgaria, China, Congo Brazzaville, Cote d'Ivoire, Congo, Ethiopia, Fiji, Gabon, Georgia, Guinea, Indonesia, Iraq, Kenya, Kosovo, Madagascar, Mali, Mozambique, Nigeria, Russia, Senegal, Serbia, South Sudan, Sri Lanka, Sudan, Syria, Thailand, Timor- Leste, Turkey, Uganda, Vietnam, Tunis and Zimbabwe.
** See Annex 2 for complete list

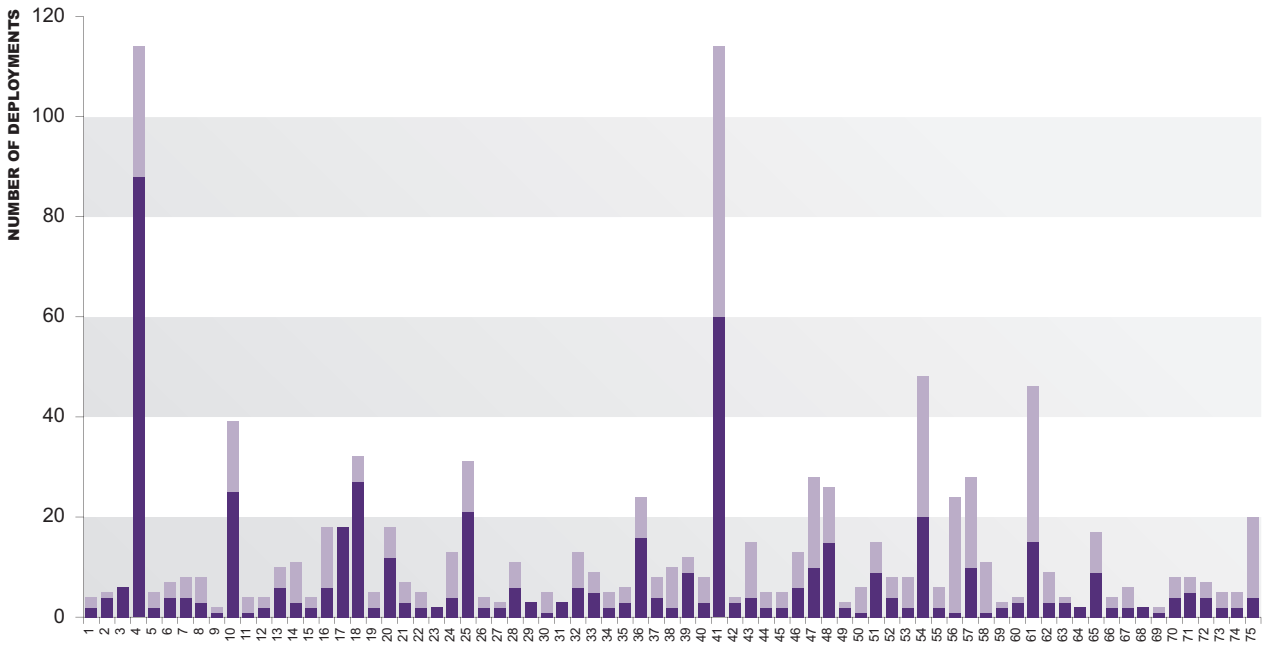
GOARN INSTITUTIONS DEPLOYED IN INTERNATIONAL OUTBREAK MISSIONS

1	WHO Angola	Luanda	Angola
2	WHO Armenia	Yerevan	Armenia
3	Queensland Department of Primary Industries & Fisheries	Brisbane	Australia
4	Australia National University	Canberra	Australia
5	Centre for International Health	Malvern	Australia
6	Curtin University of Technology	Malvern	Australia
7	Burnet Institute	Melbourne	Australia
8	University of Sydney	Sydney	Australia
9	Department of Health	Woden	Australia
10	WHO Azerbaijan	Baku	Azerbaijan
11	International Centre for Diarrhoeal Disease Research	Dhaka	Bangladesh
12	WHO Bangladesh	Dhaka	Bangladesh
13	Institute of Tropical Medicine	Antwerp	Belgium
14	European Centre for Disease Prevention and Control	Brussels	Belgium
15	Médecins Sans Frontières Belgium	Brussels	Belgium
16	WHO Botswana	Gaborone	Botswana
17	Centro Regional de Saúde Pública Brasil	Brasilia	Brazil
18	Ministry of Health Brazil	Brasilia	Brazil
19	Instituto de Infectologia Emílio Ribas	Sao Paulo	Brazil
20	WHO Bulgaria	Sofia	Bulgaria
21	Public Health Agency of Canada	Ottowa	Canada
22	Chinese Center of Disease Control and Prevention	Beijing	China
23	WHO China	Beijing	China
24	Brazzaville University Hospital	Brazzaville	Congo
25	WHO Regional Office for Africa	Brazzaville	Congo
26	WHO Cote D'Ivoire	Abidjan	Cote d'Ivoire
27	WHO Regional Office for Europe	Copenhagen	Denmark
28	WHO DR Congo	Kinshasa	DR Congo
29	Institut National de Recherche Biomédicale	Kinshasa	DRC
30	Field Epidemiology Training Programme Egypt	Cairo	Egypt
31	NAMRU-3 Egypt	Cairo	Egypt
32	WHO Regional Office for the Eastern Mediterranean	Cairo	Egypt
33	WHO Ethiopia	Addis Ababa	Ethiopia
34	WHO Fiji	Suva	Fiji
35	RES'Eaux France	Cayenne	France
36	Institut Pasteur Lyon	Lyon	France
37	Institut de médecine tropicale du service de santé des armées	Marseille	France
38	Institut de recherche pour le développement	Marseille	France
39	L'Institut Français de Recherche pour l'Exploitation de la Mer	Nantes Cedex	France
40	Centre National de la Recherche Scientifique	Paris	France
41	Epicentre	Paris	France
42	European Programme for Intervenion Epidemiology Training	Paris	France
43	Institut de Veille Sanitaire	Paris	France
44	Institut Pasteur International	Paris	France
45	Médecins Sans Frontières International	Paris	France
46	Ministry of Health France	Paris	France
47	Ministry of Health France-Hôpital Necker enfants malades	Paris	France
48	Centre International de Recherches Medicales de Franceville	Liberville	Gabon
49	WHO Gabon	Libreville	Gabon
50	WHO Georgia	Tbilisi	Georgia
51	Robert Koch Institut	Berlin	Germany
52	Bernhard-Nocht Institute	Hamburg	Germany
53	Tropical Institute Hamburg	Hamburg	Germany
54	Bundeswehr Microbiology Institute	Munich	Germany
55	Klinikum rechts der Isar, Technical University of Munich	Munich	Germany
56	WHO Guinea	Conakry	Guinea
57	WHO Regional Office for South East Asia	New Delhi	India
58	WHO Indonesia	Jakarta	Indonesia
59	WHO Iraq	Amman	Iraq
60	Health Protection Surveillance Center	Dublin	Ireland
61	Israeli Medical Association	Ramat Gan	Israel
62	Food and Agricultural Organization	Rome	Italy
63	ISS Rome	Rome	Italy
64	Italian Cooperation	Rome	Italy
65	National Institute for Infectious Diseases	Tokyo	Japan
66	US CDC Office in Kenya	Nairobi	Kenya
67	WHO Kenya	Nairobi	Kenya
68	WHO Kosovo	Pristina	Kosovo
69	Institut Pasteur Antananarivo	Antananarivo	Madagascar
70	WHO Madagascar	Antananarivo	Madagascar
71	Universiti Malaysia Sarawak	Kota Samarahan	Malaysia
72	Ministry of Health Malaysia	Putrajaya	Malaysia
73	WHO Mali	Bamako	Mali
74	WHO Mozambique	Maputao	Mozambique
75	The National Institute for Public Health and the Environment	Bilthoven	Netherlands
76	Erasmus University Medical Centre	Rotterdam	Netherlands
77	Centre de Recherche Médicale et Sanitaire	Niamey	Niger
78	WHO Nigeria	Lagos	Nigeria
79	Norwegian Institute of Public Health	Oslo	Norway
80	WHO Regional Office for the Western Pacific	Manila	Philippines
81	Instituto Gulbenkian de Ciência	Oeiras	Portugal
82	WHO Russia	Moscow	Russia
83	Institut Pasteur Dakar	Dakar	Senegal
84	WHO Senegal	Dakar	Senegal
85	WHO Serbia	Belgrade	Serbia
86	National University of Singapore	Singapore	Singapore
87	Institute of Microbiology & Immunology	Ljubljana	Slovenia
88	National Health Laboratory Service	Johannesberg	South Africa
89	National Institute for Communicable Diseases	Johannesberg	South Africa
90	WHO South Sudan	Khartoum	South Sudan
91	Epidemiology Unit, Ministry of Health	Colombo	Sri Lanka
92	WHO Sri Lanka	Columbo	Sri Lanka
93	WHO Sudan	Khartoum	Sudan
94	Karolinska Institutet Sweden	Solna	Sweden
95	Smittskyddsinstitutet	Stockholm	Sweden
96	International Committee of the Red Cross	Geneva	Switzerland
97	Médecins Sans Frontières Switzerland	Geneva	Switzerland
98	Swiss Humanitarian Aid	Geneva	Switzerland
99	United Nations Childrens Fund	Geneva	Switzerland
100	World Health Organization (WHO) Headquarters	Geneva	Switzerland
101	WHO Syria	Damascus	Syria
102	Field Epidemiology Training Programme Thailand	Bangkok	Thailand
103	Ministry of Health Thailand	Bangkok	Thailand
104	Queen Sirikit National Institute of Child Health	Bangkok	Thailand
105	Bureau of Epidemiology	Nonthaburi	Thailand
106	WHO Thailand	Nonthaburi	Thailand
107	WHO Timor-Leste	Dili	Timor Leste
108	l'Office National de la Famille et de la Population	Tunis	Tunisia
109	WHO WMC Tunis	Tunis	Tunisia
110	WHO Turkey	Ankara	Turkey
111	Uganda Virus Research Institute	Kampala	Uganda
112	WHO Uganda	Kampala	Uganda
113	African Field Epidemiology Network	Kampala	Uganda
114	Health Protection Agency	London	United Kingdom
115	London School of Hygiene and Tropical Medicine	London	United Kingdom
116	MRC National Institute of Medical Research	London	United Kingdom
117	Queen Mary University of London	London	United Kingdom
118	US Centers of Disease Control and Prevention (CDC)	Altanta	USA
119	US CDC - EID	Atlanta	USA
120	International Red Cross	New York	USA
121	United Nations Development Programme	New York	USA
122	Institut Pasteur Viet Nam	Hanoi	Viet Nam
123	WHO Viet Nam	Hanoi	Viet Nam
124	Ministry of Health Zimbabwe	Harare	Zimbabwe
125	WHO Zimbabwe	Harare	Zimbabwe

WHO AND NON WHO STAFF DEPLOYED ON MISSIONS

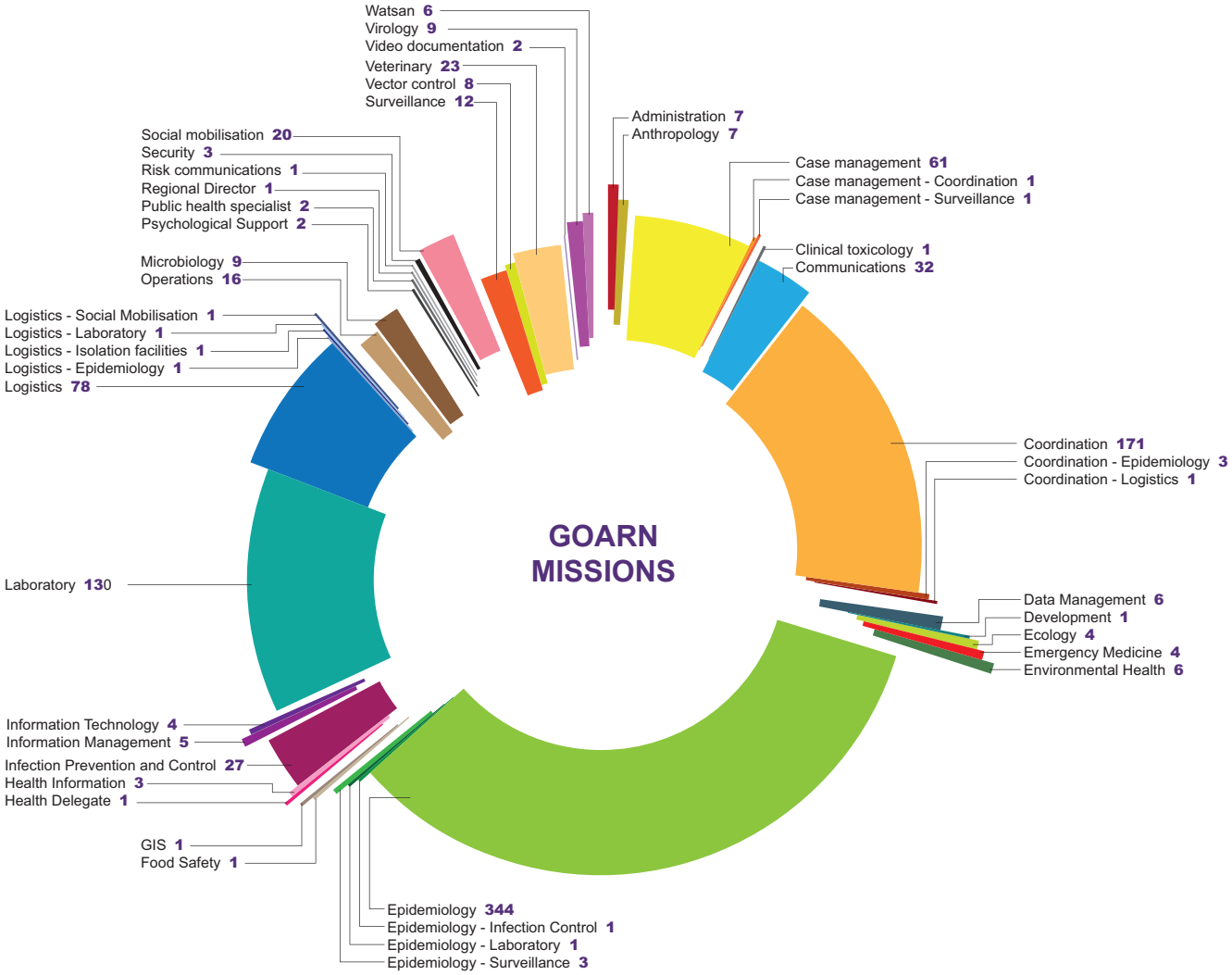


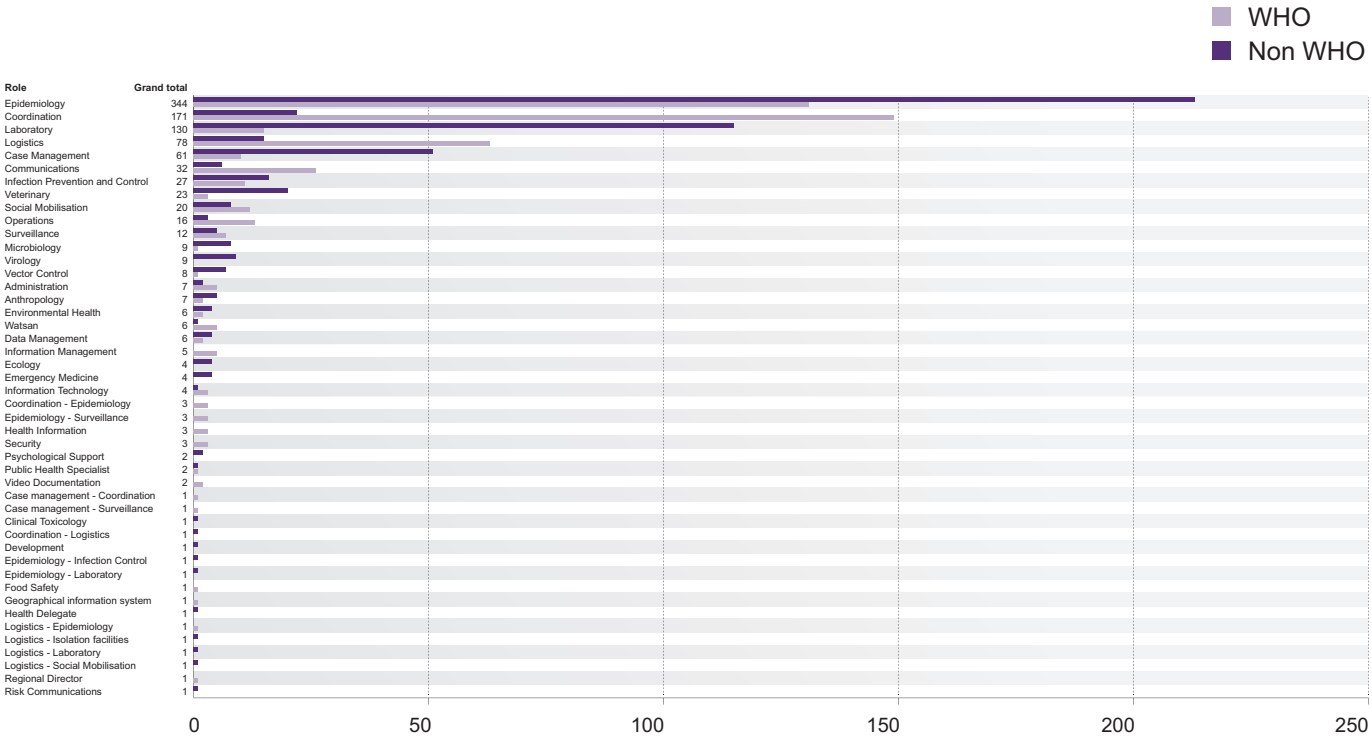
1	AHFS Afghanistan	16	Ebola HF Congo (1)	31	Nipah Bangladesh (2)	46	Yellow fever Sudan	61	Cholera Zimbabwe
2	RVF Yemen	17	SARS Hong Kong SAR	32	Ebola HF Sudan	47	AI Turkey (Van)	62	Ebola HF DRC
3	RVF Saudi Arabia	18	SARS Viet Nam	33	Meningitis Philippines	48	AI Nigeria (2006)	63	Vibrio vulcanificus New Caledonia
4	Ebola HF Uganda (Gulu)	19	SARS Singapore	34	Acute hepatitis E Chad	49	AI Ukraine	64	AI Niger
5	Meningitis Ethiopia	20	SARS Bei Jing China	35	Tsunami SEARO	50	Yellow fever Togo	65	AI Azerbaijan
6	Unknown Disease Bangladesh	21	SARS Taipei China	36	Tsunami Indonesia	51	RVF Kenya	66	AI Georgia
7	CCHF Kosovo	22	Plague Algeria	37	Dengue HF Timor-Leste	52	AI Nigeria	67	AI Armenia
8	Yellow fever Abidjan	23	Cholera Mali	38	Tsunami Sri Lanka	53	Marburg HF Uganda	68	AI Djibouti
9	Yellow fever Guinea (2001)	24	Ebola HF Congo (2)	39	Myocarditis Sri Lanka	54	Ebola HF DRC (Mweka)	69	AI Jordan
10	Ebola HF Gabon	25	A/H5N1 Viet Nam	40	Plague DRC	55	RVF Sudan	70	AI Syria
11	Ebola HF Congo (Mbomo)	26	A/H5N1 Thailand	41	Marburg HF Angola (Uige)	56	Bromide Poisoning Angola	71	AI Egypt
12	Cholera Tanzania	27	A/H5N1 Cambodia	42	Suspect Dengue/DHF sufdan	57	Ebola HF Uganda (Bundibugyo)	72	AI Iran
13	Influenza Madagascar	28	Nipah Bangladesh (1)	43	AI Indonesia (Karo)	58	RVF Madagascar	73	AI Gaza/West Bank
14	Yellow fever Senegal	29	A/H5N1 Indonesia	44	Yellow fever Guinea (2005)	59	Yellow fever Côte d'Ivoire	74	AI Lebanon
15	Hysteria Macedonia	30	Lassa fever Sierra Leone	45	Yellow fever Mali	60	Olympic Games China	75	AI Iraq



GOARN MISSIONS 2000 - 2009

ROLE DURING GOARN MISSIONS





GOARN STEERING COMMITTEE (SCOM)

To examine the working of the SCOM, the evaluation team reviewed the terms of reference of the committee, the structure of the network document, participation and involvement of GOARN partners, and the meeting reports and outcomes of the past meetings.

SCOM meetings took place in the following years and locations

Date	Location	Number of participants*
Sep 2000	Geneva	25
Mar 2001	Geneva	37
Oct 2002	Geneva	69
Jun 2003	Kuala Lumpur	49
Dec 2003	Geneva	43
Nov 2004	Johannesburg	37
Dec 2005	Singapore	38
Sep 2008	Geneva	38
Apr 2009	Geneva	43

* number includes WHO staff attending as observers

KEY FINDINGS

KEY FINDINGS 1

GOARN IS RELEVANT AND SHOULD BE CONTINUED

The independent assessment of the achievements of GOARN since 2000, indicates that the network has largely met its main aims and objectives of coordination and deployment of experts to support countries, and continues to be relevant and necessary. There is strong support for GOARN from focal points in partner institutions, Steering Committee members, and WHO officials and management.

From its inception in 2000 until the beginning of 2003, GOARN field missions were mainly in Africa and were largely responding to outbreaks of emerging viral haemorrhagic fever (VHFs), and to well-characterized infectious disease outbreaks, such as cholera, meningitis, and yellow fever. Missions were principally aimed at supporting epidemiological and microbiological field investigation, outbreak containment and rapid control.

In 2003, a previously unknown disease in humans - SARS - initially appeared both highly pathogenic and sufficiently contagious to cause large-scale outbreaks. GOARN played a major role in rapid deployment of international teams to multiple locations, and supported WHO

to engage technical institutions in international networks set up to look at critical aspects of the outbreak, and to ensure that the right steps were taken to contain the outbreak. No further cases of SARS have been diagnosed since that time.

During 2004, large outbreaks of H5N1 influenza in birds, and small clusters of incidentally-infected human cases, threatened a pandemic of influenza and called for large scale public health interventions and building of national capacity for early detection and rapid response. GOARN deployments to multiple locations were again a vital first step, and again provided the platform for coordination of the international response, and development of advice and guidance.

The Asian Tsunami Response in December 2004 and January 2005 was the first time that GOARN partners were mobilized to support an epidemic early warning system in a major post-disaster context.

Between April and July 2005, GOARN partners provided experts and mobile field laboratory support for the international efforts to control the largest outbreak so far recorded of Marburg haemorrhagic fever in Angola.

All of the GOARN missions recorded in 2006 were risk assessment and preparedness missions, and outbreak responses to small clusters of human cases of avian influenza.

The large GOARN response to cholera in Zimbabwe in 2008/2009 represented an unusual involvement for GOARN in recurrent or endemic public health problems. The network has previously deployed small missions to assist in such cases as cholera in Mali, and meningitis in the African meningitis belt, but a large-scale response was considered to be warranted by the high impact and longevity of the outbreak.

GOARN has provided a flexible platform for multilateral coordination of support during these outbreaks, and adapted to the changing needs for missions that have taken place over the first nine years of its operation.

Missions have varied greatly in size of the outbreak, number of deployments, location and complexity. No single mission can be thought of as typical or representative of GOARN's capacity.

GOARN partners are generally satisfied with how the network performs operationally during outbreaks. GOARN is particularly valued as a mechanism for mobilizing specialized multidisciplinary expertise, for providing surge capacity during outbreaks, and for its role in supporting the coordination of multilateral missions.

However, recognition of GOARN's operational strengths and success does not come without also raising important questions or concern. The review provides information to guide the future strategic development of GOARN, and the challenges presented by developments in national, and international response systems, and within WHO.

The Network has only been partially successful in improving coordination and reducing competition or duplication from bilateral response.

GOARN was established in recognition of a need for improvements in the international response system, and the Network began operations at a time when epidemic alert and response capacities were dangerously low in some countries, and parts of the world.

Over the past 10 years, global concern about the possibility of an imminent influenza pandemic, together with lessons from the emergence of SARS, and the revision of the International Health Regulations (IHR, 2005) have led to a significant global investment in outbreak alert and response capacity. Although this development is a welcome one, it nevertheless poses a challenge for GOARN. No one would argue that all nations and regions are now equally - or necessarily adequately - prepared for rapid response to disease outbreaks. However, in many instances, capacity now exists to field basic epidemiological and laboratory services.

Countries and regions are now less interested in receiving basic response aid, and this impacts the role of GOARN, and the type of support that is requested. GOARN is called upon to supply more exceptional resources and expertise, or extra hands on the job and this help is needed less often than before.

This raises two important strategic challenges.

- *First, should GOARN broaden its mission in order to expand its current role in alert and response?*
- *Second, as an institution mobilized in more exceptional circumstances, how should GOARN keep its operational profile high enough to be relevant and trusted when it is needed?*

GOARN partners are fairly pleased with the way that GOARN currently functions and they do not advocate a radical departure from current strategies or practices. Partners recognise that GOARN might do substantially more in the area of capacity-building and might strategically expand its mission to include pre-outbreak preparedness and risk assessment activities that are directly related to the networks primary aims and objectives.

KEY FINDINGS 2

GOARN ENABLES WHO TO FULFIL ITS ALERT AND RESPONSE RESPONSIBILITIES

The evaluation found that GOARN clearly fulfils an important role in one of WHO's key responsibilities/priority areas, and that the networks' aims and objectives remain relevant.

GOARN creates a direct and on-going institutional mechanism for the rapid identification, mobilization, deployment, and organization of international technical resources and expertise.

WHO has a major responsibility for providing disease alert and response assistance for the international community. Since its foundation in 1948, the control of the international spread of infectious diseases has been one of WHO's core responsibilities, and is reflected in its Constitution. WHO worked directly with national governments and donors to provide support, and has drawn on the resources of WHO Collaborating Centres, and experts when the need for international assistance arose. The International Health Regulations (IHR) 2005 reaffirmed and expanded these responsibilities. Upon request from a member state, the IHR (2005) set out WHO's responsibility to provide technical guidance and assistance, including "the mobilization of international teams of experts for on-site assistance", and also to "mobilize international assistance in order to support the national authorities in conducting and coordinating on-site assessments".[1]

Today, GOARN is one of WHO's major mechanisms for providing rapid technical support and expertise to national governments who request assistance.

GOARN creates a direct and on-going institutional mechanism for the rapid identification, mobilization, deployment, and organization of international technical resources and expertise.

1. International Health Regulations, 2005. Article 13, *Public health response.*

Based on the evaluation team's discussions with the GOARN OST, WHO officials, SCOM members, and network partners, GOARN can be described as an institutional mechanism that brings four types of coordination into alignment for the purposes of rapid alert and response:

1. to locate, mobilize, and deploy available and relevant expertise and resources from partners institutions, and also from within/across WHO;
2. to communicate (through WHO regional and country offices) with Ministries of Health about their needs and to negotiate the terms of reference for GOARN teams;
3. to bring different multilateral resources and international technical experts together as an effective team in the field;
4. to provide a two-way flow of information and communication between WHO, field teams and participating technical institutions.

GOARN's value to WHO, and to the global outbreak response community - particularly in rapidly evolving situations - is that it provides a relatively seamless mechanism for linking these different forms of coordination.

GOARN essentially represents a partnership strategy for fulfilling these responsibilities.

The Independent Evaluation found a significant tension between a functional description of GOARN as simply an operational arm of WHO's alert and response responsibilities, and alternatively, as a partnership of technical institutions and networks, supporting WHO global mandate in epidemic alert and response.

What does a partnership contribute to this "one stop shop"?

Arguably, WHO could perform each of these coordination tasks directly without working through a partnership.

The evaluation team's review and interviews suggest that partnership contributes to the integration of these tasks in subtle but important ways. Expert rosters, for example, tend to become quickly outdated; as a partnership, GOARN deepens communication links for regular and rapid updating of relevant contacts and expertise.

The GOARN partnership also brings institutions together on a technical level, facilitating rapid identification of the best available expertise and resources. Through trainings and meetings, the GOARN partnership also helps to prepare member institutions for effective integration into multilateral missions. The partnership structure also facilitates coordination and communication between WHO HQ and missions by establishing protocols and a sense of shared identity in the field.

Today, GOARN is one of WHO's major mechanisms for providing rapid technical support and expertise to national governments who request assistance.

KEY FINDINGS 3

DECIDE ON THE 'INSTITUTIONAL STATUS' OF GOARN

GOARN has a distinctive structure. On the one hand, WHO sponsors and houses GOARN, which is fully integrated into WHO's alert and response operations. WHO provides the essential financial, administrative, and logistics support for GOARN. On the other hand, GOARN was established as a «network» of technical institutions and networks, directed by its partners through the SCOM, and managed by the network's OST.

Among GOARN partners, there is little support for radical governance and institutional reforms, and partners do not question WHO lead agency role in international epidemic alert and response.

As a network, WHO is one partner among others. In practice, the evaluation team found that this hybrid governance leads to some fundamental institutional tensions that need to be addressed. Among GOARN partners, there is little support for radical governance and institutional reforms, and partners do not question WHO lead agency role in international epidemic alert and response.

Research on network governance has demonstrated that there is often a difficult choice to be made about whether a network should be directed by a lead organization or by a «Board of Directors».

Many of the evaluation team's interviews pointed to the relative weakness of GOARN's steering committee and the need to strengthen its' role. Before addressing the details of this issue, GOARN must first consider the more fundamental issue of its hybrid governance structure. Although few partners would challenge the further integration of GOARN into WHO alert and response operations, GOARN's status as an "independent" network does raise some concern within the WHO. A stronger steering committee might heighten these concerns.

On the other hand, partners may become alienated from GOARN if they feel that it advertises itself as an independent network when, de facto, it is not. Such concerns were expressed to the evaluation team by some steering committee members and partners.

The evaluation team proposes three possible scenarios for addressing this fundamental issue.

- **SCENARIO 1:**
  Make the WHO lead agency role more explicit and clarify the SCOM' s role as an advisory committee.

- **SCENARIO 2:**
  Make the independent status of GOARN explicit and strengthen the role of SCOM as a policy-determining body.

- **SCENARIO 3:**
  Allow the status of GOARN to remain somewhat ambivalent, maintaining the current role of WHO and SCOM.

KEY FINDINGS 4

STRENGTHEN THE STRATEGIC CAPACITIES OF GOARN

In the previous section, we posed WHO and SCOM leadership of GOARN as alternatives in order to call attention to the way that the current situation hinders strategic leadership. However, in this section the evaluation team considers the possibility of an institutional reform that might strengthen the capacity of *both* WHO and the SCOM to provide strategic leadership for GOARN.

The evaluation team recommends that a salaried member of WHO staff be appointed as the Chair of the SCOM and that this Chairperson undertakes (among other tasks) to strengthen the SCOM as a body capable of providing greater strategic direction to GOARN.

This recommendation primarily follows from scenario 1 above and recognizes the lead role of WHO.

However, a stronger SCOM is a central task for building GOARN as a partnership. Even if the SCOM's role is advisory to the WHO Chair, it needs to be strengthened to serve this advisory role.

The WHO SCOM Chair should be someone familiar with and engaged in WHO alert and response operations and knowledgeable about GOARN. Although the SCOM Chair should operate independently of the OST, the chairperson should create an immediate and continuous communications link between OST operations and SCOM leadership. The Chairperson can inform the SCOM of important operational developments and can communicate SCOM questions and concerns to the OST.

Although the WHO SCOM Chair should have immediate and on-going communication with the OST, it is the evaluation team's opinion that the SCOM Chair should focus on the strategic development of GOARN as a partnership. The OST necessarily has a more short-term focus as it copes with pressing operational matters. This short-term operational focus tends to displace long-term strategic pursuits.

To accomplish this, some significant fraction of the salaried time of the WHO SCOM Chair should be dedicated to conducting GOARN business. For the SCOM to function effectively, it must establish regular communications among SCOM members. Again, in our observation, a significant weakness of current governance arrangements is that the OST does not have the time to cultivate these regular communications. The WHO SCOM Chair could increase partner engagement by taking a leadership role in promoting the development of technical working groups under the SCOM and establishing and cultivating relationships with related craft networks. With operational assistance from the OST, the WHO SCOM Chair should give strategic direction to the development of the partnership.

KEY FINDINGS 5

STRUCTURE THE SCOM ACCORDINGLY

Whether the SCOM has a more advisory or policy-directing role, it remains the key intermediary institution in the development of GOARN as a partnership. The SCOM represents the partners and speaks on their behalf. As described in earlier sections and in other parts of this report, however, the role and status of the SCOM remains poorly specified and underdeveloped.

Most importantly, infrequent and irregular meetings have undermined the institutional continuity of the SCOM. In the most recent SCOM meeting, many members were newly appointed and sometimes expressed mild confusion about the role of the SCOM and of GOARN. An orderly succession of SCOM membership is essential for institutional continuity and for adequate representation of partners.

The evaluation team recommends that GOARN reformulate a "binding document" for the governance and conduct of the SCOM.

At the very least, this document should establish guidelines for regular meetings and the orderly succession of membership. As discussed above, it would be useful if it also described the level of strategic initiative that the SCOM is expected to take vis-à-vis GOARN operations and the development of the partnership.

The evaluation team's survey asked several questions to ascertain whether the partners believed that the scope of GOARN's mission needs to be refocused. Given the changing context in which GOARN operates, we asked whether GOARN should expand its mission either into pre-outbreak risk assessment or into later response phases.

We found considerable support for maintaining the status quo mission, with some measured support for expansion in the direction of pre-outbreak risk assessment. The survey also found support for GOARN playing a greater role in capacity-building, but also considerable caution about the role that GOARN could and should play. These findings point to the need for strong strategic leadership to guide GOARN's long-term strategy. Since partners appear generally satisfied with GOARN's current operation, strategic change needs to build carefully upon GOARN's current strengths.

A more active SCOM—whether of an advisory or a policy-directing nature—is an important ingredient for energizing GOARN as a partnership.

KEY FINDINGS 6

ENGAGE IN MORE ACTIVE MEMBERSHIP DEVELOPMENT

The evaluation team heard and observed various concerns about the involvement of partners in GOARN activities. Our preliminary interviews raised particular concerns about the narrow basis of membership participation on field missions. Over half the respondents to the partner survey (52.3%) reported that their institution had never participated in a GOARN mission and only a quarter of the respondents (24.9%) indicated that their institution had served on more than one mission.

42% percent of respondents who had not served on a mission found GOARN "extremely important" as a source of outbreak information.

Even fewer institutions (13.4%) have served as team leaders on GOARN missions. It showed, that a number of factors limit service on field missions, skewing representation towards the best-resourced and most competent institutions. Field missions are, of course, GOARN's core competency and the major reason for mobilizing the partners. Field missions are clearly not, however, a sufficient mechanism for integrating most partners into GOARN activities. The survey indicates that institutions that have not served on missions still find GOARN membership valuable for providing information, training, and contacts.

For example, 42% percent of respondents who had not served on a mission found GOARN "extremely important" as a source of outbreak information. GOARN trainings are also an important basis for partnership involvement. Forty-four percent of the respondents indicated that their institutions had participated in GOARN training.

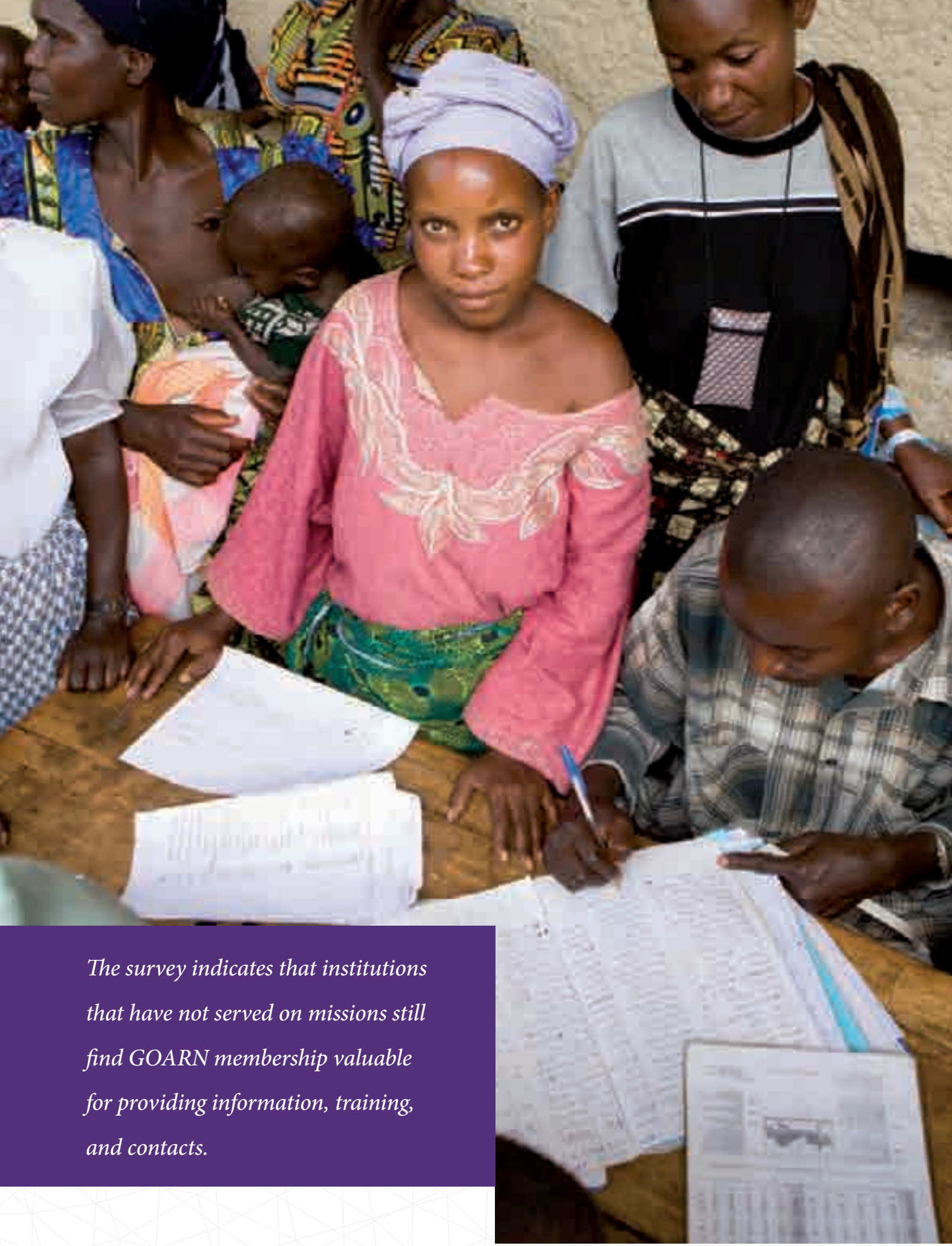
Although information and training provides a basis for more broad-based membership participation, the evaluation team's overall impression is that the wider sense of partnership in GOARN is languishing. In part, this can be traced back to the operational pressures that GOARN must face. The OST focuses much of its energy on the immediate imperatives of organizing and deploying field teams. In this capacity, the OST interacts frequently with a limited number of institutions. However, the OST has had less opportunity to cultivate a wider sense of GOARN partnership.

The survey explored one possible mechanism for expanding participation in GOARN—the creation of technical working groups that would report to the SCOM. These technical working groups could identify best practices and establish guidelines for GOARN missions. If GOARN decides to broaden its mission into pre-outbreak risk assessment, working groups might be established to support these activities. Working groups could also be used to contribute to the training curriculum and to evaluate lessons learned from previous missions. Nearly half (44.7%) of respondents thought that such groups would have a "very positive impact" on the functioning of the SCOM. In terms of broadening membership participation, 38% of respondents believed that working groups would have a "very positive impact," while 40% felt that they would have a "somewhat positive impact." The SCOM should develop a plan to create and support such groups.

Although the survey identified some of the goals and interests of GOARN partners, the purpose of this survey was to evaluate general issues of strategic importance. The SCOM might consider commissioning another survey of partners that focuses on identifying their needs and capacities. This survey could be used to develop strategies for building membership commitment and participation.

GOARN also has some weaknesses in geographical representation. As stated earlier, GOARN began as network focused on Africa. Later, in response to SARS and to avian flu, GOARN expanded operations to Asia and to other parts of the world. However, representation from countries in South Asia, the former Soviet Republics, Latin America, and to lesser extent, the middle east, is not strong. Strong partnerships with WHO regional offices might be an effective strategy for expanding membership and there was some evidence that GOARN was pursuing this strategy.

One of the potential values of building a wider and more active partnership is to improve the visibility of GOARN during field missions. A number of interviews referred to the "weak branding" of GOARN, which led to uncertainty and even confusion about GOARN's role during field missions. Partnership development is a good strategy for improving GOARN branding, because active partners will become well-informed ambassadors for GOARN.



The survey indicates that institutions that have not served on missions still find GOARN membership valuable for providing information, training, and contacts.

KEY FINDINGS 7

IMPROVE INFORMATION-SHARING WITH PARTNERS

The survey of partners found that, in quantitative terms, partners are broadly satisfied with the timing and quality of information they are receiving from GOARN, though the website is not used as extensively as might be hoped.

More concerns, however, were raised in open-ended responses about the quality and timeliness of GOARN outbreak information. The "value-added" of GOARN information, when compared with information provided by services like ProMED, is not always clear to partners. Because information-sharing is so central to the GOARN mission and an important basis for relating to partners, the Evaluation Team sought additional feedback from partners during the April 2009 partners meeting.

Although the evaluation team does not have specific recommendation about how to revise access procedures to the GOARN SharePoint site, feedback from the partners' meeting suggests this is a source of frustration and also a constraint on the effective and appropriate transmission of GOARN information. Some suggested replacing the SharePoint site with an RSS feed. While acknowledging that GOARN must balance the goal of information security with the goal of wider access to information, GOARN should consider options for refining these procedures. This issue might present a good opportunity for the creation of a technical working group that reports to the SCOM. In addition, a survey of partner needs (recommended in the previous section) might be used to further ascertain how GOARN could provide the most useful and distinctive information to partners.

Feedback from partners also suggests that standards for information presentation and sharing are important. Many of the comments relate to standards related to the level of verification and validation of information being shared. Again, this issue of standards presents an ideal opportunity for the creation of a GOARN technical working group.

A number of respondents also suggested the value of allowing other organizations and partners to upload information on to the GOARN SharePoint. This may indeed be one of the potential advantages of GOARN's partnership structure. However, adopting a more distributed strategy of information-sharing would clearly raises difficult issues of information verification and validation. It is recommended that GOARN consider the tradeoffs involved in allowing partners and other organizations to upload information.

Standards for information presentation and sharing are important.

KEY FINDINGS 8

IMPROVE 'CAPACITY ASSESSMENT' AND 'LESSON LEARNING' OF GOARN MISSIONS

As with information-sharing, the Evaluation Team found that the topic of capacity-building deserved special attention. Our initial interviews suggested that the OST and others in WHO were concerned that GOARN was not fulfilling (and perhaps could not fulfil) its original mandate to engage in capacity-building.

We learned that capacity-building is difficult in the context of GOARN operations, due to the rapid response requirements, short-term missions, and limits on mission size. These discussions led to including questions about capacity building in the partner survey. In their responses to these questions, partners voiced strong support for a greater capacity-building role for GOARN. This was followed up with two additional open-ended questions about capacity-building at the April 2009 partners meeting). Again, most partners were favourable towards a greater capacity-building role. A number of responses insisted that others have the primary role for capacity-building and GOARN's capacity for capacity-building is quite limited.

A number of responses also suggested that a GOARN capacity-building role should be closely tied to its response mission.

The Evaluation Team agrees that if GOARN is to take a greater role in capacity-building, it must complement, support, and flow from its core competence in alert and response and should be compatible with GOARN's own capacities. A number of interviews suggested that GOARN is well-placed during missions to observe limitations in capacity.

The evaluation team recommends that GOARN consider institutionalizing a "capacity assessment" report as one of its routine products of its missions. Such reports would not purport to be comprehensive assessments of capacity. However, outbreak response missions often reveal capacity shortcomings that more formal and comprehensive reports overlook. Capacity assessments could be forwarded to relevant authorities and to potential donors and stakeholders for consideration and follow-up after missions.

If GOARN decides to expand its mission to include pre-outbreak risk assessment, more formal capacity assessments might be conducted in conjunction with these risk assessments.

GOARN has established a successful training program in alert and response. Its training program may be the most important and appropriate vehicle for engaging in capacity-building. However, the evaluation team sees an opportunity to build more effective links between missions and trainings. GOARN missions could be tasked with authoring more systematic "lessons learned" reports. These reports could become an effective source of teaching materials for training programs.

KEY FINDINGS 9

IMPROVE RECORD-KEEPING AND FINANCIAL MANAGEMENT

The value of systematically collecting feedback on "lessons learned" during missions brings us to the more general issue of GOARN record-keeping. Through the evaluation team's attempts to gather information for this evaluation, it was discovered that GOARN's capacity for systematic record-keeping is quite weak. Although information on missions is available, it is often quite fragmentary. Most of this information is descriptive in nature (who was deployed and when, etc.).

This information does not provide a real basis for evaluating the "lessons learned" from missions. Another weakness of GOARN record-keeping is related to financial management. It was nearly impossible to establish a clear understanding of revenue streams and mission costs from the data we received. In part, this failure results from the complexity of funding missions in the WHO environment. But the Evaluation Team believes that protocols for record-keeping and financial management could still be more systematically established.

CONCLUSION

The Independent external evaluation was completed in 2011 and managed to produce a record for future reference of the operations, deployments and participating institutions during GOARN's first 9 years of operation.

The network was born out of a field-driven concern to improve coordination during outbreaks and be able to tap into globally available expertise against a backdrop of heightened awareness of the potential of (re-)emerging infectious diseases to spread rapidly across the globe. GOARN proved capable of improving field coordination and deploying experts when needed. And the range of outbreaks that called for a GOARN response during these years indeed confirmed the risk of emerging infectious diseases and the need for a coordinated local, regional and global response.

The evaluation team was impressed by the value of, and commitment to, GOARN as expressed by the numerous stakeholders the team communicated with.

Some shortcomings were also observed, most of which can be easily remedied. Most important will be to strengthen the capacity of both WHO and the SCOM to provide strategic leadership for GOARN.

ANNEX 1: GOARN missions included in the assessment, with start date, and number of deployments (total, WHO, Non-WHO)

Event ID Numeric	Start Date	Event name	Non WHO	WHO	Grand Total
1	16/06/00	AHFS Afghanistan	2	2	4
2	20/09/00	RVF Yemen	4	1	5
3	21/09/00	RVF Saudi Arabia	6	0	6
4	11/10/00	Ebola HF Uganda (Gulu)	88	26	114
5	23/04/01	Meningitis Ethiopia	2	3	5
6	23/05/01	Unknown Disease Bangladesh	4	3	7
7	15/06/01	CCHF Kosovo	4	4	8
8	20/09/01	Yellow fever Abidjan	3	5	8
9	30/10/01	Yellow fever Guinea (2001)	1	1	2
10	10/12/01	Ebola HF Gabon	25	14	39
11	22/12/01	Ebola HF Congo (Mbomo)	1	3	4
12	25/02/02	Cholera Tanzania	2	2	4
13	13/08/02	Influenza Madagascar	6	4	10
14	11/10/02	Yellow fever Senegal	3	8	11
15	16/12/02	Hysteria Macedonia	2	2	4
16	10/02/03	Ebola HF Congo (1)	6	12	18
17	11/03/03	SARS Hong Kong SAR	18	0	18
18	06/03/03	SARS Viet Nam	27	5	32
19	07/04/03	SARS Singapore	2	3	5
20	19/02/03	SARS Bei Jing China	12	6	18
21	16/03/03	SARS Taipei China	3	4	7
22	28/06/03	Plague Algeria	2	3	5
23	10/12/03	Cholera Mali	2	0	2
24	20/10/03	Ebola HF Congo (2)	4	9	13
25	07/01/04	A/H5N1 Viet Nam	21	10	31
26	25/01/04	A/H5N1 Thailand	2	2	4
27	04/02/04	A/H5N1 Cambodia	2	1	3
28	03/02/04	Nipah Bangladesh (1)	6	5	11
29	19/02/04	A/H5N1 Indonesia	3	0	3
30	19/04/04	Lassa fever Sierra Leone	1	4	5
31	30/04/04	Nipah Bangladesh (2)	3	0	3
32	16/05/04	Ebola HF Sudan	6	7	13
33	18/01/05	Meningitis Philippines	5	4	9
34	29/08/04	Acute hepatitis E Chad	2	3	5
35	03/01/05	Tsunami SEARO	3	3	6
36	04/01/05	Tsunami Indonesia	16	8	24
37	24/01/05	Dengue HF Timor-Leste	4	4	8
38	04/01/05	Tsunami Sri Lanka	2	8	10

Event ID Numeric	Start Date	Event name	Non WHO	WHO	Grand Total
39	23/02/05	Myocarditis Sri Lanka	9	3	12
40	16/02/05	Plague DRC	3	5	8
41	08/03/05	Marburg HF Angola (Uige)	60	54	114
42	09/11/05	Suspect Dengue/DHF Sudan	3	1	4
43	18/05/06	Avian Influenza Indonesia (Karo)	4	11	15
44	04/12/05	Yellow fever Guinea	2	3	5
45	14/11/05	Yellow fever Mali	2	3	5
46	23/11/05	Yellow fever Sudan	6	7	13
47	05/01/06	Avian Influenza Turkey (Van)	10	18	28
48	10/02/06	Avian Influenza Nigeria	15	11	26
49	13/01/06	Avian Influenza Ukraine	2	1	3
50	27/01/07	Yellow fever Togo	1	5	6
51	03/01/07	RVF Kenya	9	6	15
52	25/01/07	Avian Influenza Nigeria	4	4	8
53	13/07/07	Marburg HF Uganda	2	6	8
54	03/09/07	Ebola HF DRC (Mweka)	20	28	48
55	22/10/07	RVF Sudan	2	4	6
56	26/10/07	Bromide Poisoning Angola	1	23	24
57	29/11/07	Ebola HF Uganda (Bundibugyo)	10	18	28
58	12/04/08	RVF Madagascar	1	10	11
59	07/06/08	Yellow fever Côte d'Ivoire	2	1	3
60	27/07/08	Olympic Games China	3	1	4
61	28/11/08	Cholera Zimbabwe	15	31	46
62	27/12/08	Ebola HF DRC	3	6	9
63	16/02/09	Vibrio vulcanificus New Caledonia	3	1	4
64	09/03/06	Avian Influenza Niger	2	0	2
65	26/01/06	Avian Influenza Azerbaijan	9	8	17
66	02/05/06	Avian Influenza Georgia	2	2	4
67	28/01/06	Avian Influenza Armenia	2	4	6
68	22/05/06	Avian Influenza Djibouti	2	0	2
69	07/02/06	Avian Influenza Jordan	1	1	2
70	28/01/06	Avian Influenza Syria	4	4	8
71	24/01/06	Avian Influenza Egypt	5	3	8
72	25/01/06	Avian Influenza Iran	4	3	7
73	30/03/06	Avian Influenza Gaza/West Bank	2	3	5
74	24/01/06	Avian Influenza Lebanon	2	3	5
75	20/01/06	Avian Influenza Iraq	4	16	20
Grand Total			**536**	**487**	**1023**

ANNEX 2: Deployments by institution

Institution name	Deployments	%
WHO HQ	240	23.46%
CDC Atlanta	147	14.37%
WHO AFRO	67	6.55%
PHAC	40	3.91%
MSF	29	2.83%
HPA UK	20	1.96%
FAO	18	1.76%
NIID Japan	18	1.76%
WHO Uganda	18	1.76%
WHO Angola	17	1.66%
InVS Paris	16	1.56%
MSF Belgium	15	1.47%
NAMRU-3 Egypt	15	1.47%
ICDDR,B	14	1.37%
EPIET	13	1.27%
NICD South Africa	11	1.08%
WHO DR Congo	11	1.08%
WHO EURO	11	1.08%
WHO Zimbabwe	11	1.08%
Institut Pasteur Paris	10	0.98%
WHO Iraq	10	0.98%
Epicentre	9	0.88%
WHO Viet Nam	9	0.88%
WHO WPRO	9	0.88%
MoH Brazil	8	0.78%
Robert Koch Institut (RKI)	7	0.68%
WHO Gabon	7	0.68%
ANU Australia (FETP)	6	0.59%
Swiss Humanitarian Aid	6	0.59%
Universiti Malaysia Sarawak	6	0.59%
WHO EMRO	6	0.59%
WHO Indonesia	6	0.59%
WHO SEARO	6	0.59%
CDC Kenya	5	0.49%
ECDC	5	0.49%
Institut Pasteur Antananarivo	5	0.49%
ISS Rome	5	0.49%
MoH France	5	0.49%
SMI Sweden	5	0.49%
CNRS France	4	0.39%
ICRC	4	0.39%
Queen Sirikit National Institute of Child Health Thailand	4	0.39%
WHO China	4	0.39%
WHO Congo Brazzaville	4	0.39%
WHO Sri Lanka	4	0.39%
WHO Sudan	4	0.39%
WHO WMC Tunis	4	0.39%
CIRMF	3	0.29%
Epidemiology Unit MoH Sri Lanka	3	0.29%
FETP Thailand	3	0.29%
Institut Pasteur, Dakar	3	0.29%
MSF/Epicentre	3	0.29%
National Health Laboratory Service (NHLS) South Africa	3	0.29%
UNICEF	3	0.29%
WHO Armenia	3	0.29%
WHO Bangladesh	3	0.29%
WHO Kosovo	3	0.29%
WHO Senegal	3	0.29%
Burnet Institute Australia	2	0.20%
CDC/UVRI Uganda	2	0.20%
Erasmus University Medical Centre NL	2	0.20%
Institut Pasteur Dakar	2	0.20%
Institut Pasteur Lyon	2	0.20%
Institute of Microbiology & Immunology Ljubljana Slovenia	2	0.20%
Israeli Medical Association	2	0.20%
Tropical Institute Hamburg	2	0.20%
United Nations Development Programme	2	0.20%
University of Malaysia Medical Centre	2	0.20%
University of Sydney	2	0.20%
WHO Azerbaijan	2	0.20%
WHO Cote D'Ivoire	2	0.20%
WHO Ethiopia	2	0.20%
WHO Kenya	2	0.20%
WHO Madagascar	2	0.20%
WHO Nigeria	2	0.20%
WHO Timor-Leste	2	0.20%
Bernhard-Nocht Institute Germany	1	0.10%
BoE Thailand	1	0.10%
Brazzaville University Hospital	1	0.10%
Bundeswehr Microbiology Institute Munich	1	0.10%
Centres for Disease Control, China	1	0.10%
Centres for Disease Control, Kenya - AFENET	1	0.10%
Centre for International Health Australia	1	0.10%
Centro Regional de Saúde Pública Brazil	1	0.10%
CERMES	1	0.10%
CDC - EID	1	0.10%
Curtin University of Technology Australia	1	0.10%
Department of Health, Australia	1	0.10%
Field Epidemiology Training Programme, Egypt	1	0.10%
FHI Norway	1	0.10%
Health Protection Surveillance Center (HPSC) Ireland	1	0.10%
IMTSSA-Marseille	1	0.10%
Institut National de Recherche Biomédicale	1	0.10%
Institut Pasteur Viet Nam	1	0.10%
Instituto de Infectologia Emílio Ribas	1	0.10%
Instituto Gulbenkian de Ciência	1	0.10%
InVS/IFREMER	1	0.10%
International Red Cross	1	0.10%
Institut de recherche pour le developpement	1	0.10%
Italian Cooperation	1	0.10%
ITT Antwerp	1	0.10%
Karolinska Institutet Sweden	1	0.10%
LSHTM	1	0.10%
Ministry of Health Australia	1	0.10%
Ministry of Health France - Hôpital Necker enfants malades	1	0.10%
Ministry of Health Malaysia	1	0.10%
Ministry of Health Thailand	1	0.10%
Ministry of Health Zimbabwe	1	0.10%
MRI -TU Munich	1	0.10%
MSF Belgium /EPICENTRE	1	0.10%
MSF Belgium/EPICENTRE	1	0.10%
MSF Switzerland	1	0.10%
National Institute of Medical Research UK	1	0.10%
NUS Singapore	1	0.10%
ONFP Tunisia	1	0.10%
Queen Mary University of London+J529	1	0.10%
Queensland Department of Primary Industries & Fisheries	1	0.10%
Reseaux France	1	0.10%
RIVM Netherlands	1	0.10%
WHO Botswana	1	0.10%
WHO Bulgaria	1	0.10%
WHO Fiji	1	0.10%
WHO Georgia	1	0.10%
WHO Guinea	1	0.10%
WHO Mali	1	0.10%
WHO Mozambique	1	0.10%
WHO Russia	1	0.10%
WHO Serbia	1	0.10%
WHO South Sudan	1	0.10%
WHO Syria	1	0.10%
WHO Thailand	1	0.10%
WHO Turkey	1	0.10%
Grand Total	**1023**	**100%**

Global Outbreak Alert and Response Network
World Health organization
20 Avenue Appia
Geneva 1211
Switzerland

http://www.who.int/csr/outbreaknetwork/en/

World Health Organization